gument.

Theorem: If $\varphi = C_0 + C_1 u_1 + C_2 u_2 - \frac{u_1^2 + u_2^2}{2}$, then all flows are conic. For other solutions φ of (1) in general they are not conic, however, to each solution φ there corresponds a certain solution of a transformed initial equation which describes a conic flow.

These theoretical results are used for the solution of the problem of two plane pistons. There is 1 Soviet reference.

PRESENTED: September 21, 1957, by A.D. Sakharov, Academician

SUBMITTED: November 21, 1957

10(6) SOV/20-123-5-17/59

AUTHORS: Sidorov, A. F., Yanenko, N. N.

TITLE: On the Problem of Unsteady Plane Flows of a Polytropic Gas of Straight Line Characteristics (K voprosu o nestatsionarnyh ploskikh techeniyakh politropnogo gaza s pryamolineynymi kharakteristikami)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 5, pp 832-834 (USSR)

ABSTRACT: This paper gives a complete classification of the flows mentioned in the title. The above-mentioned straight-line characteristics are lines of equal level of the quantities u_i and c in the phase space x_1, x_2, t. In this case, the hydrodynamical equations have the following form: Euler (Eyler) equation:

$$\frac{\partial u_i}{\partial t} + 2\varkappa c \frac{\partial c}{\partial x_i} + \sum_{k=1}^{2} u_k \frac{\partial u_i}{\partial x_k} = 0, \quad i = 1,2$$

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Continuity equation:

$$2\varkappa\left(\frac{\partial c}{\partial t}+\sum_{k=1}^{2} u_k \frac{\partial c}{\partial x_k}\right) + c\sum_{k=1}^{2} \frac{\partial u_k}{\partial x_k} = 0$$

It holds that $\varkappa = \frac{1}{\gamma-1}$; $\gamma = \frac{c_p}{c_v} > 1$; $c^2 = \left(\frac{dp}{d\varrho}\right)_S$; $p = a^2(S)\varrho^\gamma$

γ denotes the coefficient of the adiabatic line and S - the entropy. The equations of the characteristics are given as $dx_1/\Delta_1 = dx_2/\Delta^2 = dt/1$ where Δ_i is assumed to depend on the parameters α_1 and α_2: $x_i - \Delta_i t = d_i$, $i = 1, 2$. By differentiating these equations with respect to x_k and t, expressions are found for $\partial\alpha_i/\partial x_k$ and $\partial\alpha_i/\partial t$ and the

Card 2/4 variables α_1 and α_2 are then used in the initially mentioned

On the Problem of Unsteady Plane Flows of a Polytropic Gas of Straight Line Characteristics

equations which, after this operation, can be written down as $A_i + tB_i = 0$, $i = 1, 2, 3$. The symbols A_1, A_2, A_3, B_1, B_2 P_3 are written in full. The conditions $A_i = 0$, $B_i = 0$, $i = 1, 2, 3$ have to be satisfied. In this way, the authors obtained an overdetermined system of 6 equations for 5 unknown functions. Investigation of the compatibility of this system gives the following results: (r denotes the rank of the system $\left|\begin{matrix} \frac{\partial u_1}{\partial \alpha_1} & \frac{\partial u_1}{\partial \alpha_2} \\ \frac{\partial u_2}{\partial \alpha_1} & \frac{\partial u_2}{\partial \alpha_2} \end{matrix}\right|$)

1) The case $r = 1$ is trivial, it gives flows with $c = \text{const}$
2) The case $r = 2$ gives conic flows, or potential flows, or turbulent flows (only in the case $\gamma = 2$).

Card 3/4 The case $r = 3$ gives only conic flows. The following conclusion

On the Problem of Unsteady Plane Flows of a Polytropic Gas of Straight Line Characteristics

may be drawn from the above-discussed considerations: In the class of the unsteady plane adiabatic motion of a gas ($\gamma \neq 2$) of straight-line characteristics, there are no turbulent flows that are different from simple waves and conic flows.

PRESENTED: July 12, 1958, by A. D. Sakharov, Academician

SUBMITTED: March 28, 1958

YANENKO, N.N.

16(1) PHASE I BOOK EXPLOITATION SOV/2660

Vsesoyuznyy matematicheskiy s"yezd. 3rd, Moscow, 1956

Trudy. t. 4: Kratkoye soderzhaniye sektsionnykh dokladov. Doklady inostrannykh uchenykh (Transactions of the 3rd All-Union Mathematical Conference in Moscow. vol. 4: Summary of Sectional Reports. Reports of Foreign Scientists) Moscow, Izd-vo AN SSSR, 1959. 247 p. 2,200 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Matematicheskiy institut.

Tech. Ed.: G.N. Shevchenko; Editorial Board: A.A. Abramov, V.G. Boltyanskiy, A.M. Vasil'yev, B.V. Medvedev, A.D. Myshkis, S.M. Nikol'skiy (Resp. Ed.), A.G. Postnikov, Yu. V. Prokhorov, K.A. Rybnikov, P. L. Ul'yanov, V.A. Uspenskiy, N.G. Chetayev, G. Ye. Shilov, and A.I. Shirshov.

PURPOSE: This book is intended for mathematicians and physicists.

COVERAGE: The book is Volume IV of the Transactions of the Third All-Union Mathematical Conference, held in June and July 1956. The book is divided into two main parts. The first part contains summaries of the papers presented by Soviet scientists at the Conference that were not included in the first two volumes. The second part contains the text of reports submitted to the editor by non-Soviet scientists. In those cases when the non-Soviet scientist did not submit a copy of his paper to the editor, the title of the paper is cited and, if the paper was printed in a previous volume, reference is made to the appropriate volume. The papers, both Soviet and non-Soviet, cover various topics in number theory, algebra, differential and integral equations, function theory, functional analysis, probability theory, topology, mathematical problems of mechanics and physics, computational mathematics, mathematical logic and the foundations of mathematics, and the history of mathematics.

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10(2)

AUTHORS: Sidorov,A.F. and Yanenko,N.N. (Chelyabinsk) SOV/140-59-1-19/25

TITLE: Instationary Plane Flows of a Polytropic Gas With Rectilinear Generators (Neustanovivshiyesya ploskiye techeniya politropnogo gaza s pryamolineynymi obrazuyushchimi)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Matematika, 1959, Nr 1, pp 187-198 (USSR)

ABSTRACT: The present paper completes a publication of Yu.Ya.Pogodin et al. [Ref 1]. For the investigation of the instationary flow of a polytropic gas the authors use a method different from that of [Ref 1]. It is proved that in the class of instationary plane adiabatic gas motions ($\gamma \neq 2$) with rectilinear characteristics there exist no whirlings beside of simple waves and conic flows. Thus to the considered class there belong 1. simple waves, 2. conic flows, 3. potential flows, 4. for $\gamma = 2$ whirlings depending on two arbitrary functions of a variable.
There is 1 Soviet reference.

SUBMITTED: July 2, 1958

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16(1)

AUTHOR: Yanenko, N.N.

SOV/20-125-6-8/61

TITLE: On a Difference Method for the Solution of the Multidimensional Equation of Heat Conduction (Ob odnom raznostnom metode scheta mnogomernogo uravneniya teploprovodnosti)

PERIODICAL: Doklady Akademii nauk SSSR,1959,Vol 125,Nr 6, pp 1207 - 1210 (USSR)

ABSTRACT: Let the mixed problem

$$(1)\ \frac{\partial u}{\partial t} = a^2 \sum_{i=1}^{m} \frac{\partial^2 u}{\partial x_i^2}\ ,\ u(x_1,\ldots,x_m,0)=\varphi(x_1,..,x_m)\ ,$$

$$u(x_1,..,x_{s-1}\ ,\ 0,x_{s+1},..x_m) = f_s(x_1,..,x_{s-1},x_{s+1},..,x_m,t)\ ,$$

$$u(x_1,..,x_{s-1},\ 1,x_{s+1},..,x_m) = g_s(x_1,..,x_{s-1},x_{s+1},..,x_m,t)$$

be posed in $0 \leq x_i \leq 1$, $0 \leq t \leq T$. Let the difference scheme

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On a Difference Method for the Solution of the Multidimensional Equation of Heat Conduction

SOV/20-125-6-8/61

$$
(2)\quad
\begin{cases}
\dfrac{u^{n+1}_{i..i_m} - u^{n}_{i..i_m}}{\tau} = \Lambda\left[\dfrac{1-\alpha}{2}\, u^{n+1}_{i_1..i_m} + \dfrac{1+\alpha}{2}\, u^{n}_{i_1,..i_m}\right] ; \\
\Lambda\, u^{n}_{i_1,..,i_m} = \sum_{s=1}^{m} \Lambda_s\, u^{n}_{i_1..i_m} ; \quad u^{o}_{i_1..i_m} = \varphi_{i_1..i_m} ; \\
u_{i_1...i_{s-1}\,0\,i_{s+1}..i_m} = f^{n}_{si_1...i_{s-1},i_{s+1}...i_m} , \\
u^{n}_{i_1..i_{s-1},N_{s+1},i_{s+1}...i_m} = g^{n}_{si_1..,i_{s-1}\,i_{s+1}...\,i_m}
\end{cases}
$$

correspond to this problem. It is shown that the scheme (2) can be approximated by the simpler scheme

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On a Difference Method for the Solution of the Multidimensional Equation of Heat Conduction

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$$(3)\begin{cases}\dfrac{u^{s/m} - u^{s-1/m}}{\tau} = \Lambda_s\left[\dfrac{1-\alpha}{2}\,u^{s/m} + \dfrac{1+\alpha}{2}\,u^{s-1/m}\right], \\ u^{s/m} = u^{n+s/m}_{i_1\ldots i_m}, \quad u^{o}_{i_1\ldots i_m} = \varphi_{i_1\ldots i_m} \text{ etc. as above.}\end{cases}$$

The solution of (3) converges in the mean to the solution of (2) with the exactness $O(\tau)$.
There are 2 references, 1 of which is Soviet, and 1 Indian.

PRESENTED: January 8, 1959, by S.L. Sobolev, Academician

SUBMITTED: December 23, 1958

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66158

~~16(1)~~ 16.3500, 16.3909, 16.6500 SOV/20-128-5-10/67

AUTHORS: Yanenko, N.N., Suchkov, V.A., Pogodin, Yu.Ya.

TITLE: Difference Solution of the Thermal Conductivity Equation in Curvilinear Coordinates

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 5, pp 903-905 (USSR)

ABSTRACT: In the domain $D(0 \leqslant x_i \leqslant 1)$ with the boundary Γ the authors solve the mixed Cauchy problem

(1) $$\frac{\partial u}{\partial t} = \sum_{i,j=1}^{2} a_{ij} \frac{\partial^2 u}{\partial x_i \partial x_j} \equiv Lu , \quad a_{11}a_{22} - a_{12}^2 > 0$$
$a_{ij} = \text{const}$

(2) $$u(x_1, x_2, 0) = \varphi(x_1, x_2) \quad x_i \in D$$
$$u|_{\Gamma} = f(x,t), \quad 0 \leqslant t < T, \quad x \in \Gamma$$

They apply the scheme

(5) $$\frac{u^{n+\frac{1}{2}} - u^n}{\tau} = \Lambda_{11} u^{n+\frac{1}{2}} + \Lambda_{12} u^n$$

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Difference Solution of the Thermal Conductivity Equation in Curvilinear Coordinates

$$(5)\quad \frac{u^{n+1}-u^{n+1/2}}{\tau} = \Lambda_{12}u^{n+1/2} + \Lambda_{22}u^{n+1},$$

where

$$\Lambda_{11}=a_{11}\frac{\Delta_1\Delta_{-1}}{h_1^2},\quad \Lambda_{12}=a_{12}\frac{(\Delta_1+\Delta_{-1})(\Delta_2+\Delta_{-2})}{4h_1h_2},\quad \Lambda_{22}=a_{22}\frac{\Delta_2\Delta_{-2}}{h_2^2}$$

$$(3)\quad \Delta_i = T_i-E,\quad \Delta_{-i}=E-T_{-i},\quad i=1,2$$

$$T_{\pm 1}u = u(x_1\pm h_1, x_2),\quad T_{\pm 2}u = u(x_1, x_2\pm h_2).$$

The scheme approximates (1), is spectrally stable and converges. The scheme can be used for the calculation of the equation of heat conductivity in Lagrange coordinates.

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SOV/20-128-5-10/67

Difference Solution of the Thermal Conductivity Equation in Curvilinear Coordinates

There are 2 references, 1 of which is Soviet, and 1 American.

PRESENTED: June 6, 1959, by N.N.Bogolyubov, Academician

SUBMITTED: March 7, 1959

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~~16(1)~~ 16.3500 66397 1

AUTHORS: Anuchina,N.N., and Yanenko,N.N. SOV/20-128-6-1/63

TITLE: Implicit Splitting Schemes for Hyperbolic Equations and Hyperbolic Systems

PERIODICAL: Doklady Akademii nauk SSSR, 1959,Vol 128,Nr 6,pp 1103-1105 (USSR)

ABSTRACT: K.A.Bagranovskiy and S.K.Godunov [Ref 1] approximated a system of partial differential equations of hyperbolic type by a one-dimensional explicit difference scheme which was stable under certain assumptions on the step. The authors use an analogous method which is denoted as a splitting method, in order to approximate equations of hyperbolic type for an arbitrary step by one-dimensional implicit difference schemes. E.g. to the equation

(18) $$\frac{\partial^2 p}{\partial t^2} - \sum_{i=1}^{m} \frac{\partial^2 p}{\partial x_i^2} = 0$$

there corresponds the splitting scheme

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Implicit Splitting Schemes for Hyperbolic Equations and Hyperbolic Systems SOV/20-128-6-1/63

$$(19)\qquad \frac{p^{n+1+\frac{s}{m}}_{-p}\; p^{n+1+\frac{s-1}{m}}_{-p}\; p^{n+\frac{s}{m}}_{+p}\; p^{n+\frac{s-1}{m}}}{2} = -\frac{\Delta_s \Delta_{-s}}{h_s^2}\,\frac{p^{n+1+\frac{s}{m}}_{+p}\; p^{n+1+(\frac{s-1}{m})}_{+p}\; p^{n+\frac{s}{m}}_{+p}\; p^{n+\frac{s-1}{m}}}{4}\,.$$

The scheme (19) approximates (18), is spectrally stable and consequently convergent. Linearized equations of the gas dynamics are considered in detail.
There is 1 Soviet reference.

PRESENTED: June 6, 1959, by N.N.Bogolyubov, Academician.

SUBMITTED: March 7, 1959

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YANENKO, N. N. (Chelyabinsk)

"On Compressible flows characterized by Supplementary Differential Equations. ("overdetermined" flows)."

report presented at the First All-Union Congress on Theoretical and Applied Mechanics, Moscow, 27 Jan - 3 Feb 1960.

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AUTHOR: Yanenko, N.N.

TITLE: Economical Implicit Schemes (Method of Fractional Steps)

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 134, No. 5, pp. 1034-1036

TEXT: Let the linear system of equations

$$(2)\qquad \frac{\partial u_i}{\partial t} = \sum_{j,\alpha} a_{ij\alpha_1\ldots\alpha_m} D_1^{\alpha_1}\ldots D_m^{\alpha_m} u_j, \text{ where } D_i = \frac{\partial}{\partial x_i},$$

be written in the form of matrices

$$(1)\qquad \frac{\partial u}{\partial t} = P(D)u.$$

Let

$$(3)\qquad \Lambda(T)u = 0$$

be a homogeneous difference scheme, where

$$(4)\qquad \Lambda(T) = \sum_{\alpha} a_{\alpha\alpha_0\alpha_1\ldots\alpha_m} T_0^{\alpha_0} T_1^{\alpha_1}\ldots T_m^{\alpha_m} \quad \text{and}$$

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Economical Implicit Schemes (Method of Fractional Steps)

(5) $T_i^{\alpha_i} f(x_0,x_1,\ldots,x_m) = f(x_0,\ldots,x_i+\alpha_i h_i,\ldots,x_m)$, $x_0=t$.

Let

(8) $u^n(x_1,\ldots,x_m) = u(n\tau,x_1,\ldots,x_m)$.

In connection with the application of the fractional steps in (Ref. 1-6) the author proves the following general theorem: The scheme with fractional steps:

(9) $$\frac{u^{n+s/p} - u^{n+(s-1)p}}{\tau} = \Pi_{1s}(T)u^{n+s/p} + \Pi_{2s}(T)u^{n+\frac{s-1}{p}}, \quad s=1,\ldots,p$$

is assumed to satisfy the conditions

(10) $$\Pi_{1s}(T)\sim P_{1s}(D),\ \Pi_{2s}(T)\sim P_{2s}(D),\ \sum_{s=1}^{p}(P_{1s}+P_{2s}) = P\ .$$

Every scheme (9) is assumed to possess a multiplication matrix g_s (see (Ref. 7)) so that

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Economical Implicit Schemes (Method of Fractional Steps)

(11) $\| S_1 S_2 \cdots S_p \| = 1+O(\tau)$.

Then the solution of (9) amounts to the solution of (1) in the mean.
There are 7 references: 4 Soviet, 2 American and 1 Indian.

PRESENTED: May 28, 1960, by S.L.Sobolev, Academician

SUBMITTED: March 14, 1960

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16.3500

AUTHOR: Yanenko, N. N.

TITLE: On invariant differential relations for hyperbolic systems of quasilinear equations

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Matematika, no. 3, 1961, 185-194

TEXT: The author considers the hyperbolic system

$$\sum_{j,k} a_{ijk} \frac{\partial u_j}{\partial x_k} = F_i;\ i, j = 1,\ldots, m;\ k = 1,\ldots,n, \qquad (1.1)$$

where a_{ijk} and F_i are functions of $x_1,\ldots, x_n, u_1,\ldots, u_m$. A special case is concerned with the systems

$$\sum_{j,k} a_{ijk}(u_1,\ldots, u_m) \frac{\partial u_j}{\partial x_k} = 0 \qquad (1.2)$$

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or

$$\sum_k \frac{\partial \Lambda_{ik}}{\partial x_k} = 0 \qquad (1.3)$$

where Λ_{ik} are functions of $u_1, \ldots, u_m$.
Assume that additional relations

$$F_\alpha \left(u_j, x_k, \frac{\partial u_j}{\partial x_k}, \frac{\partial^2 u_j}{\partial x_k \partial x_l}, \ldots \right) = 0 \qquad (1.4)$$

are assigned to the system (1.1) so that the system (1.1), (1.4) is already overdetermined. The order of (1.4) is called the order of the relation. Classes of solutions determined by the relations (1.4) are denoted as classes with differential characteristic. A nontrivial solution which joins the trivial solution

$$u_i = u_{i0} \qquad (1.5)$$

by the (characteristic) surface S is denoted as travelling wave of (1.2) or (1.3). The simplest example of a travelling wave is the Riemannian wave. The relation

$$f(u_i, \frac{\partial u_j}{\partial x_k}) = 0 \qquad (2.1)$$

is called invariant if

$$f(u_i, \frac{\partial u_j}{\partial x_k})_+ = f(u_i \frac{\partial u_i}{\partial x_k})_- , \qquad (2.2)$$

holds on S, where + and - refer to the different sides of S.

In the present paper it is shown that in the case of simple waves the differential relations have a characteristic property: they are invariant under the jumps of the derivatives on the characteristic surface. Especially, it holds the theorem: The Riemannian travelling wave is characterized by an invariant divergent relation, and conversely

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every motion with invariant divergent relation is a Riemannian wave. For the proof it is shown that an arbitrary divergent relation

$$\frac{\partial \Lambda_k}{\partial x_k} = 0, \quad k = 1, \ldots, m \qquad (3.10)$$

can be brought to the form

$$\frac{\partial \phi_\alpha}{\partial x_\alpha} = 0, \quad \alpha = 1, \ldots, m - 1 . \qquad (3.11)$$

The author considers simple waves of the quasilinear system

$$\frac{\partial u_i}{\partial t} + a_{ij} \frac{\partial u_j}{\partial x} = 0 \qquad (6.1)$$

(see P. D. Lax (Ref. 8: Hyperbolic systems of conservation laws, II. Communs Pure and Appl. Math., vol. X, pp. 537-566, 1957)). In (Ref.8)

On invariant differential relations...

they were determined by the relations

$$\varphi_\alpha (u_1, \ldots, u_m) = 0, \quad \alpha = 1, \ldots, m-1 \qquad (6.2)$$

and it was shown that they are travelling waves. The author shows that the relations (6.2) are invariant.

Finally, it is stated that the travelling waves of the dynamics of gases are always potential motions.

There are 6 Soviet-bloc and 2 non-Soviet-bloc references. The reference to English-language publication reads as follows: P. D. Lax, Hyperbolic systems of conservation laws, II. Communs Pure and Appl. Math., vol. X, pp. 537-566, 1957.

SUBMITTED: March 5, 1960

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No. 5100

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AUTHOR: Yanenko, N. N.

TITLE: On implicit difference methods for the multi-dimensional heat conduction equation

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Matematika, no. 4, 1961, 148-157

TEXT: In chapter 1° the author describes the methods of (Ref. 1, J. Douglas. On the numerical integration of $u_{xx} + u_{yy} = u_t$ by implicit methods. J. Industr. Math. Soc., v. 3, p.42-65, 1955), (Ref. 2, D. W. Placeman, H. H. Rachford. The numerical solution of parabolic and elliptic differential equations. J. Industr. Math. Soc., v. 3, p. 284, 1955) and (Ref. 3, J. Douglas, H. H. Rachford. On the numerical solution of heat conduction problems in two and three space variables. Trans. Amer. Math. Soc., no. 2, p. 421-439, 1956).

In chapter 2° the author uses the paper due to K. A. Bagrinovskiy, S.K. Godunov (Ref. 4, Raznostnyye metody dlya mnogomernykh zadach, [Difference methods for multi-dimensional problems] DAN SSSR, v. 115, no. 3, 431-433, 1957), where multi-dimensional difference equations were

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X

On implicit difference methods for ...

solved by a reduction to two-dimensional calculating schemes. The author calls this method the "splitting up method" and applies it to the solution of a mixed boundary value problem for the heat conduction equation. At first the author forms the scheme

$$\frac{u^{n+1} - u^n}{\tau} = \alpha_1 \Lambda u^{n+1} + \alpha_0 \Lambda u^n, \quad \alpha_0 + \alpha_1 = 1, \quad \alpha_1 \geq 0 \qquad (1.5)$$

with $\alpha_0 = 0$, $\alpha_1 = 1$ and then it is replaced by the split up implicit scheme

$$\frac{u^{n+\frac{s}{m}} - u^{n+\frac{s-1}{m}}}{\tau} = \Lambda_s u^{n+\frac{s}{m}}, \quad s = 1,\ldots,m \ . \qquad (2.2)$$

The uniform convergence of the solution of (2.2) to the solution of the considered mixed problem is proved. In the case (1.5) with $\alpha_0 \neq 0$, $\alpha_1 \neq 0$, for the corresponding split up scheme

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On implicit difference methods for ...

$$\frac{u^{n+\frac{s}{m}} - u^{n+\frac{s-1}{m}}}{\tau} = \alpha_1 \Lambda_s u^{n+\frac{s}{m}} + \alpha_0 \Lambda_s u^{n+\frac{s-1}{m}} \qquad (2.15)$$

the author proves the spectral stability and the convergence in the mean.

In chapter 3° the author describes the method of (Ref. 8, G. A. Baker Jr, T. A. Oliphant. An implicit numerical method for solving the two-dimensional heat equation. Quart. Appl. Math., v. XVII, no. 4, p.361-373, 1960) and (Ref. 9. G. A. Baker Jr. An implicit numerical method for solving the n-dimensional heat equation. Quart. Appl. Math., v. XVII, no. 4, p. 440-443, 1960) and shows that this method in essential is identical with the "splitting up method".

There are 5 Soviet-bloc and 7 non-Soviet-bloc references. The references to the 4 most recent English language publications read as follows: J. Douglas, H. H. Rachford. On the numerical solution of heat conduction problems in two and three space variables. Trans. Amer. Math.

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On implicit difference methods for . . . S/140/61/000/004/013/013 C111/C222

Soc., no. 2, p. 421-439, 1956; J. Douglas. On the relation between stability and convergence in the numerical solution of linear parabolic and hyperbolic differential equations. J. Industr. Math. Soc., v. 4, no. 1, p. 20-37, 1956; G. A. Baker Jr., T. A. Oliphant. An implicit numerical method for solving the twodimensional heat equation. Quart. Appl. Math., v. XVII, no. 4, p.361-373, 1960; G. A. Baker Jr. An implicit numerical method for solving the n-dimensional heat equation. Quart. Appl. Math., v. XVII, no. 4, p. 440-443, 1960.

SUBMITTED: March 5, 1960

Card 4/4

16.6700 39904 S/044/62/000/007/083/100 C111/C333

AUTHORS: Shurygin, V. A., Yanenko, N. N.

TITLE: On the realization of algebraic-differential algorithms on electronic computers

PERIODICAL: Referativnyy zhurnal, Matematika, no. 7, 1962, 69, abstract 7V332. ("Probl. kibernetiki", no. 6, M., Fizmatgiz, 1961, 33-43)

TEXT: Considered is the realization of algorithms connected with analytical transformations on the electronic computer "Strela". The suggested algebraic-differential program (ADP) permits us to solve quite a large class of problems on the compatability of systems of partial differential equations, as well as other problems. The ADP transforms the so-called polynomials, i. e. expressions

$$\sum \pm a_i x_1^{\alpha_{1i}} x_2^{\alpha_{2i}} \ldots x_n^{\alpha_{ni}}, \qquad (1)$$

where a_i, α_{ki} -- arbitrary numbers and x_k -- letters, which can also be functions of other letters if they are variable. Every mathematical letter expression can be written in the form (1) with corresponding

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On the realization of algebraic-. . . S/044/62/000/007/083/100
C111/C333

designations. ADP carries out algebraic operations with polynomials (addition, subtraction, multiplication), as well as substitutions of one polynomial in another one instead of a variable (superposition), differentiates polynomials and effects several other auxiliary operations. The sequence of operations which are to be applied to the polynomials is given as a pseudo-program in which the numbers of the polynomials are mentioned rather than the polynomials themselves. The operations are given as row-pseudo-commands. It is said that the application of ADP produces the necessary effect, e. g., when calculating the polynomial determinant of order no higher than five. In the case of complicated calculating schemes and extensive output polynomials, the solution of the problem is not effective when using ADP.

[Abstracter's note: Complete translation.]

Card 2/2

YANENKO, N. N. (Chelyabinsk)

Convergence of the fractional step method for the heat conduction equation with variable coefficients. Zhur. vych. mat. i mat. fiz. 2 no.5:933-937 S-O '62. (MIRA 16:1)

(Boundary value problems)
(Differential equations)

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C111/C333

AUTHORS: Yanenko, N. N. Boyarintsev, Yu. Ye.

TITLE: Convergence of difference schemes for the heat conduction equation with variable coefficients

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 139, no. 6, 1961, 1322-1324

TEXT: The authors consider the mixed Cauchy problem

$$\frac{\partial u}{\partial t} = \sum_{i=1}^{m} \frac{\partial}{\partial x_i}\left[\varkappa(x_1, x_2, \ldots, x_m, t)\ \frac{\partial u}{\partial x_i}\right], \qquad (1)$$

$$\varkappa(x_1, x_2, \ldots, x_m, t) \geqslant \varkappa_0 > 0;$$

$$u(x_1, x_2, \ldots, x_m, 0) = \varphi(x_1, x_2, \ldots, x_m); \qquad (2)$$

$$u(x_1, x_2, \ldots, x_{s-1}, 0, x_{s+1}, \ldots, x_m, t) = f_s(x_1, \ldots, x_{s-1}, x_{s+1}, \ldots, x_m, t),$$

$$u(x_1, x_2, \ldots, x_{s-1}, l, x_{s+1}, \ldots, x_m, t) = g_s(x_1, \ldots, x_{s-1}, x_{s+1}, \ldots, x_m, t). \qquad (3)$$

Card 1/5

where $\varkappa(x,t)$, $\varphi(x)$, $f_s(x,t)$, $g_s(x,t)$ are sufficiently smooth.

For the solution of (1) - (3) the authors propose the difference scheme

$$A_s(ar^{n+1})\,u^{n+1} = A_1\,[(1-a)\,r^n]\,u^n, \qquad 0 < a < 1; \tag{4}$$

$$u^0_{i_1 \ldots i_m} = \varphi_{i_1 \ldots i_m} = \varphi(i_1 h_1, \ldots, i_m h_m); \tag{5}$$

$$u^n_{i_1 \ldots i_{s-1}, 0, i_{s+1}, \ldots i_m} = f^n_{s i_1 \ldots i_{s-1} i_{s+1} \ldots i_m},$$

$$u^n_{i_1 \ldots i_{s-1}, N_s+1, i_{s+1} \ldots i_m} = g^n_{s i_1 \ldots i_{s-1} i_{s+1} \ldots i_m}, \tag{6}$$

where

Card 2/5

$$u^n = (u^n_{l_1 \dots l_m}) = u(l_1 h_1, \dots, l_m h_m, n\tau);$$

$$l_s = 0, 1, \dots, (N_s + 1); \quad (N_s + 1) h_s = 1;$$

$$r^n = (r^n_{sl_1 \dots l_m}); \quad r^n_{sl_1 \dots l_m} = \frac{\varkappa^n_{l_1 \dots l_s + 1/2 \dots l_m} \tau}{h_s^2};$$

$$A_s(\alpha r) = E - \alpha B(r); \quad A_s[(1-\alpha) r] = E + (1-\alpha) B(r);$$

$$B(r) = \sum_{s=1}^{m} B_s; \quad B_s = (B^l_{sl'}); \qquad (7)$$

$$B^l_{sl'} = r_{sl_1 \dots l_s - 1 \dots l_m} \delta^l_{l_1 \dots l_s \dots l_m} -$$

$$- (r_{sl_1 \dots l_s - 1 \dots l_m} + r_{sl_1 \dots l_s \dots l_m}) \delta^l_{l_1 \dots l_s \dots l_m} + r_{sl_1 \dots l_s \dots l_m} \delta^l_{l_1 \dots l_s \dots l_m};$$

$\delta^{j_1 \dots j_m}_{i_1 \dots i_m} = \delta^{j_1}_{i_1} \dots \delta^{j_m}_{i_m}$; δ^j_i denotes the Kronecker symbol.

Card 3/5

Convergence of difference schemes ...

According to the theorem of equivalence of R. D. Rikhtmayer (Ref. 1: Raznostnyye metody resheniya krayevykh zadach [Difference method for the solution of boundary value problems], 1960, pp. 57) it is necessary and sufficient for the convergence of (4) - (6) that the operator

$$C_n = A_2^{-1} (\alpha r^{n+1}) A_1 [(1 - \alpha) r^n] \qquad (8)$$

possesses a norm satisfying

$$\|C_n\| = 1 + d_n\tau, \quad |d_n| \leq K; \qquad (9)$$

where the constant K does not depend on n, τ, h.

The authors state that this property of C_n exists in the present case by introduction of two auxiliary operators C and c with constant coefficients and by proving with the aid of four lemmata that C_n is stable if C is stable, and that C_n is unstable if c is unstable. By applying the Neumann criterion for determining the stability of c and C then it follows:

Card 4/5

Convergence of difference schemes . . .

Theorem 2: If $1/2 \leqslant \alpha \leqslant 1$ or $0 \leqslant \alpha < 1/2$ and

$$\sum_{s=1}^{m} R_s \leqslant \frac{1}{2-4a} , \qquad (19)$$

then the solution of (4) - (6) converges in the mean to the solution of (1) - (3). [Abstracter's note: The a in (19) is nowhere defined.]

Here $R_s = \max_{i_1,\ldots,i_m} \{ r_{si_1,\ldots i_m} \}$.

There is 1 Soviet-bloc reference.

PRESENTED: March 31, 1961, by S. L. Sobolev, Academician

SUBMITTED: January 2, 1961

Card 5/5

YANENKO, N.N.

Weak approximation of systems of differential equations. Sib. mat. zhur. 5 no.6:1431-1434 N-D '64. (MIRA 17:12)

$$\left[\frac{1}{v}\frac{\partial\varphi}{\partial t}+\vec{\Omega}\nabla\varphi+\sigma_t\varphi=\frac{\sigma_s}{4\pi}\int d\vec{\Omega}'\varphi(r,\vec{\Omega}',t)+S(r,\vec{\Omega},t)\right. \qquad (1)$$

for which a mixed Cauchy problem is set up in a cylindrical region

Card 1/2

ACCESSION NR: AP4044870

having a base D and a height T. An approximate method [illegible]

ASSOCIATION: None

SUBMITTED: 27May64 ENCL: 00

SUB CODE: MA, NP

L 43140-66 EWT(d)/T/EWP(1) IJP(c)

ACC NR: AP6013890 SOURCE CODE: UR/0020/66/167/006/1242/1244

AUTHOR: Yanenko, N. N.; Demidov, G. V.

ORG: Computer Center, Siberian Branch, Academy of Sciences, SSSR (Vychislitel'nyy tsentr Sibirskogo otdeleniya Akademii nauk SSSR)

TITLE: Investigation of the Cauchy problem by the method of weak approximation

SOURCE: AN SSSR. Doklady, v. 167, no. 6, 1966, 1242-1244

TOPIC TAGS: Cauchy problem, approximation method, linear operator, differential operator, Banach space

ABSTRACT: Convergence of the method of fractional steps in differential form when solving a proper Cauchy problem in Banach space is considered without the assumption of correctness of the initial Cauchy problem and it is demonstrated that this correctness in the result of uniform correctness of a specific auxiliary Cauchy problem. The proposed method is based on the idea of weak approximation of differential operators. The following definition is stated: The family of functions $F_\tau(x,t)$ weakly approximates with respect to t the function $F(x,t)$ for $0 < t < T$ and $X \in \Omega \subset \Omega C E^m$ if

$$\int_{t_1}^{t_2} [F_\tau(x, s) - F(x, s)]\, ds = \delta(x, t_1, t_2, \tau)$$

Card 1/2 UDC: 517.919

L 43140-66

ACC NR: AP6013890

and $\|\delta\| \to 0$ as $\tau \to 0$ for any fixed permissible t_1, t_2, and the family of linear differential operators of $L_\tau(x, t)$ weakly approximates with respect to t the operator of $L(x,t)$ if a weak approximation exists for the coefficients. Five theorems regarding the initial and auxiliary Cauchy problems are developed. The paper was presented by Academician Kantorovich, L. V., 16 July 65. Orig. art. has: 11 formulas.

SUB CODE: 12/ SUBM DATE: 10Jul65/ ORIG REF: 002/ OTH REF: 004

Card 2/2 MLP

YANES, A.V.

Calculation of heat flows in the ice cover. Probl.Arkt.i Antarkt. no.1:49-58 '59. (MIRA 13:7)
(Ice--Thermal properties)

SHAMONT'YEV, V.A.; YANES, A.V.

Some features of the winter hydrological regime in the northern part of the Greenland Sea. Probl.Arkt.i Antarkt. no.5:71-77 '60.
(MIRA 14:4)

(Greenland Sea—Hydrology)

IANES, A.V.

Thawing of snow and ice in the central Arctic. Probl.Arkt.i Antarkt. no.11:59-64 '62. (MIRA 16:2)
(Arctic regions—Thawing)

ACC NR: AT6028735 (N) SOURCE CODE: UR/3116/66/269/000/0005/0012

AUTHOR: Shpaykher, A. O. (Candidate of geographical sciences); Yanes, A. V.

ORG: none

TITLE: Relationship between waters of the North Atlantic and macrosynoptic processes

SOURCE: Leningrad. Arkticheskiy i antarkticheskiy nauchno-issledovatel'skiy institut. Trudy, v. 269, 1966. Odeanograficheskiye i gidrometeorologicheskiye issledovaniya Arkticheskikh morey (Oceanographic and hydrometeorological studies of Arctic Seas), 5-12

TOPIC TAGS: heat balance, ocean dynamics, Arctic climate, synoptic meteorology

ABSTRACT: Heat loss in the Arctic Ocean during the winter months is discussed. While the total figures are not as yet available, the magnitude of the effects of such an interaction is evident from the fact that Atlantic waters discharging through the Faeroe-Shetland Strait amount to 133,100 cubic kilometers each year. The discharge through the Fram Strait is 56,000 cubic kilometers per year. Fluctuation in the quantity of heat carried by the discharging waters of the Atlantic during the year varies from the mean value by as much as 45%, or $128,598 \cdot 10^{12}$ calories. On the basis of such studies, the yearly forecasts of temperatures of water may be made with a fair degree of accuracy. As much as 58.9% of the heat brought in by the Atlantic waters escapes into atmosphere. In the case of the Kara Sea, losses of heat into the atmosphere are 3 times

Card 1/2 UDC: 551.463.6:551.511.33(261) : (98)

ACC NR: AT6028735

greater in winter than in summer. The investigations showed that the losses of heat stored in Atlantic waters, which discharged into the Arctic basin, fully account for the distribution of temperature and other features of the atmospheric circulation. The authors agree with other investigators that the transfer of heat is faster in the meridional direction than across. In all probability, Atlantic waters give off heat both directly into the atmosphere and by diffusing it into colder waters. Orig. art. has: 3 tables.

SUB CODE: 08/ SUBM DATE: none/ ORIG REF: 009

Card 2/2

YANES. Kh. I., Cand of Tech Sci -- (diss) "Investigation of a three-phase induction regulators with various schemes of winding." Tallin, 1957, 26 pp (Leningrad Polytechnical Institute im Kalinin) 100 copies (KL, 33-57, 88)

ESOP, H.; HELLAM, H.; HOLLMANN,R.; JANES, H.; KANASAAR, E.; KROON, A.; PLAKK, P.; PUUSEPP, E.; RIIKOJA, H.; PLAKS, E., tekhn. red.

[General electric engineering] Uldine elektrotekhnika. By Esop, H.i dr. Tallin, Eesti Riikiik Kirjastus, 1954. 948 p. (MIRA 15:1)
(Electric engineering)

JANES, Hans; KAASIK, Paul; PUUSEPP, Eugen; VOLDEK, Aleksander; VORK, H., prof., retsenzent; OORN, F., inzh., retsenzent; ABO, L., red.; VAHTRE, I., tekhn. red.

[Electric machinery] Elektrimasinad [By] H.Janes ia teised. Tallinn, Eesti riiklik kirjastus, 1961. 647 p. (MIRA 15:5)
(Electric generators) (Electric transformers)

JANES, Harri, kand. med. nauk; RAIG, M., otv. red.

[Poisoning by pesticides and its prevention] Mürgistused taimekaitsevahenditega ja nende vältimine. Tartu, Vabariiklik Sanitaarhariduse Maja, 1963. 25 p. [In Estonian] (MIRA 17:7)

ACCESSION NR: AT4042288 S/0000/63/003/000/0107/0114

AUTHOR: Liyn, Kh. A.; Yanes, Kh. I.

TITLE: Operation of a flat straight-line induction pump with side mounted superconductor bars

SOURCE: Soveshchaniye po teoreticheskoy i prikladnoy magnitnoy gidrodinamike. 3d, Riga, 1962. Voprosy* magnitnoy gidrodinamiki (Problems in magnetic hydrodynamics); doklady* soveshchaniya, v. 3. Riga, Izd-vo AN LatSSR, 1963, 107-114

TOPIC TAGS: hydromagnetics, electromagnetic induction pump, straight line induction pump, pump EMN-6, liquid aluminum pump, hydromagnetic pump operation, superconductor bar, net pump power, pump efficiency, pump pressure level, metal flow rate

ABSTRACT: The net power, head, efficiency and net to total power ratio of an EMN-6 electromagnetic induction pump for liquid aluminum transfer are analyzed mathematically in relation to the rate of flow and feed line frequency (0-15 m/sec, 0-150 cycles/sec., 19.4 amps., 380 or 383 v). The flow channel of non-conducting material and superconductor bars are side-mounted externally. The results are plotted graphically and indicate that calculations ignoring power losses to steel material of the magnetic circuit are appropriate in qualitative analyses of pump operation. Quantitative evaluations ignoring such losses produced errors of up to + 12.6% for

Card 1/2

ACCESSION NR: AT4042288

maximum efficiency, and less than + 2.5% for net power and head, while variations resulting in the net to total power ratio were insignificant. Orig. art. has: 4 graphs and 18 equations.

ASSOCIATION: none

SUBMITTED: 04Dec63 ENCL: 00

SUB CODE: ME NO REF SOV: 004 OTHER: 000

Card 2/2

TIISMUS, Kh.A., kand. tekhn. nauk; YANES, Kh.I.[Jänes, H.], kand. tekhn. nauk; SYRMUS, I.[Sõrmus, I.], red.

[Transport of liquid magnesium by means of an electromagnetic pump] Transport zhidkogo magniia pri pomoshchi elektromagnitnogo nasosa. Tallin, Gos. kom-t Soveta ministrov Estonskoi SSR po koordinatsii nauchno-issl. rabot, 1964. 20 p. (MIRA 17:12)

ACCESSION NR: AP4021559 S/0136/64/000/003/0051/0054

AUTHOR: Yanes, Kh. I.; Tiysmus, Kh. A.; Vaynshteyn, G. M.

TITLE: Experimental pumping of hot magnesium by means of an EMN-7 induction pump

SOURCE: Tsvetny*ye metally*, no. 3, 1964, 51-54

TOPIC TAGS: magnesium, electromagnetic pump, nichrome wire, diatomic refractory, stainless steel channel, hot magnesium, induction pump

ABSTRACT: An electromagnetic EMN-7 pump for the pumping of hot magnesium was developed at the Tallin Polytechnic Institute. The design was based on Professor A. I. Vol'dek's calculations (see enclosure). Laboratory tests of the pump installations were conducted by Giproalyuminiy (State Institute for Aluminum) and industrial tests by VAMI (All-Union Aluminum and Magnesium Institute) the Berezniki Titanium and Magnesium Combine and the Berezniki branch of the All-Union Aluminum and Magnesium Institute. The expected service temperature of the pump is 800 C. Specifications are as follows: rated output of 5 m^3/h;

Card 1/3

ACCESSION NR: AP4021559

height of magnesium feed with nominal productivity of 6m; length of 1040 mm; width of 575 mm; height of 420 mm; weight of 310 kg; active inductor and channel length of 750 mm; wall thickness of channel of 3 mm; forced aircooling of the winding; induction heating windings; and stage productivity control carried out by the shifting of induction windings and the continouus control by reversing them. The rated voltage is 380 v, frequency 50 Kc and the number of phases 3. The pump is capable of dissolving any "track chill" by means of heating elements made of Nichrome and installed in the tracks. The mean rate of magnesium movement in the pump channel was 3.5 m/sec. Within 10 days the pump raised 2900 tons of magnesium to a height of 1.9 m. Since argon (5-10 mm Hg) atmosphere was used there was no burning out of magnesium. Stainless steel for the channels and diatomic refractory for the metal track proved satisfactory. The orig. art. has: 6 figures.

ASSOCIATION: None
SUBMITTED: 00 DATE ACQ: 08Apr64 ENCL: 01
SUB CODE: ES NO REF SOV: 000 OTHER: 000

Card 2/3

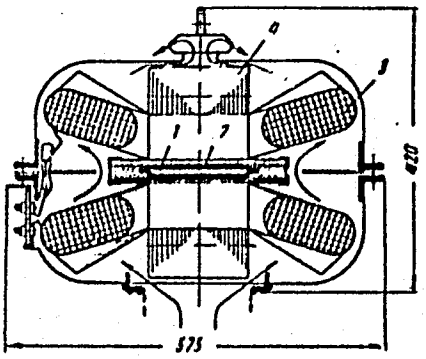

fig. 1

Schematic cross section of EMN-7. 1- slit-like channel for liquid magnesium; 2-thermal insulation ; 3- double layer 3 phase windings ; 4-magnetic circuit block with adjusting spool

Card 3/3

L 10638-66 EWT(d)/EWT(l)/EWT(m)/EWP(w)/EPF(n)-2/EWP(v)/EWP(j)/T/EWP(t)/EWP(b)/EWA(h)/
ACC NR: AR5023755 ETC(m)/EWP(k) IJP(c) SOURCE CODE: UR/0196/65/000/008/K019/K019
JD/WW/JG/EM/DJ/RM

SOURCE: Ref. zh. Elektrotekhnika i energetika, Abs. 8K114

AUTHOR: Ristkheyn, E. M.; Tiysmus, Kh. A.; Yanes, Kh. I.

TITLE: Principal data and design features of EMN-7 magnesium pump

CITED SOURCE: Tr. Tallinsk. politekhn. in-ta, v. A, no. 214, 1964, 91-100

TOPIC TAGS: liquid metal pump, magnesium / EMN-7 liquid metal pump

TRANSLATION: The design of an EMN-7 magnesium pump and its individual assemblies (metal channel and its thermal insulation, inductor, and other parts) are described. Dimensions of the pump and its mounting are reported, as well as all its technical data. The EMN-7 pump was developed and built in the Tallin Polytechnic Institute in 1962. Figs 7.

SUB CODE: 13

HW

Card 1/1 UDC: 621.318.38:621.65

L 32597-66 EWT(1) LJP(c)
ACC NR: AR5018674 SOURCE CODE: UR/0196/65/000/007/A008/A008

6
B

AUTHOR: Vallaste, E.V.; Yanes, Kh.I.

ORG: none

TITLE: Distribution of the magnetic field of a rectangular coil

SOURCE: Ref. zh. Elektrotekhnika i energetika, Abs. 7A58

REF SOURCE: Tr. Tallinsk. politekhn. in-ta, v. A, no. 214, 1964, 79-89

TOPIC TAGS: magnetic field, magnetic field measurement

TRANSLATION: A study was made of a magnetic field created in the air by a current flowing along an infinitely thin rectilinear conductor of finite length. Practical procedures are proposed for calculating magnetic induction in a fixed point, as well as straight along, parallel to, or crossing the conductor. The magnetic field of a rectangular circuit considered to be approximately coinciding with the magnetic field of the rectangular coil is also calculated. Illustrations 8, references 3. See also RZhE, 1965, 5K100. Yu. Iossel'.

SUB CODE: 09

Card 1/1 BK UDC: 621.318.38:539.122

L 15625-66 EWT(d)/EWT(l)/EWT(m)/EWP(w)/EPF(n)-2/T/EWA(d)/EWP(y)/EWP(t)/EWP(k)/EWP(z)/
ACC NR: AT5028829 EWP(b)/(N)EWA(h)/ SOURCE CODE: UR/2807/64/000/214/0091/0100
ETC(m)-6 IJP(c) MJW/JD/WW/EM/DJ/JXT(N)

AUTHOR: Ristkheyn, E. M.; Tiysmus, Kh. A.; Yanes, Kh. I.

ORG: Tallinn Polytechnic Institute (Tallinskiy politekhnicheskiy institut)

TITLE: Basic data and structural characteristics of the EMN-7 magnesium pump

SOURCE: Tallinn. Politekhnicheskiy institut. Trudy. Seriya A, no. 214, 1964. Issledovaniye i proyektirovaniye elektromagnitnykh sredstv peremeshcheniya zhidkikh metallov; sbornik trudov, no. 2, 91-100

TOPIC TAGS: magnesium, liquid metal pump, magnetic induction

ABSTRACT: The authors describe the EMN-7 pump developed at the Tallinn Polytechnical Institute in 1962. This is a plane linear induction pump with a bilateral retardation coil which has a full-pitche three-phase winding with correction coils in all phases. The unit measures 1040 × 575 × 420 mm and pumps magnesium at a rate of 2.0 kg/sec or 0.0014 m^3/sec to a height of 6.0 m at a temperature of 750°C. The unit uses 380 v three-phase power at a frequency of 50~. The installation uses 6.9 kw for pumping and 6.5 kw for heating. The complete technical specifications of

UDC: 621. 318. 38

Card 1/2

L 15625-66

ACC NR: AT5028829

the pump are given. The pump channel is made from Kh25 chrome steel with a wall thickness of 3 mm. The various structural elements of the pump are discussed and schematic diagrams are given for some of them. Orig. art. has: 7 figures.

SUB CODE: 13/ SUBM DATE: 00/ ORIG REF: 000/ OTH REF: 000

Card 2/2

(N) L 12041-66 EWT(d)/EWT(m)/EWP(w)/EWP(v)/T/EWP(t)/EWP(k)/EWP(b)
ACC NR: AT5028830 SOURCE CODE: UR/2807/64/000/214/0111/0122
EWA(h)/ETC(m) IJP(c) JD/WW/JG/EM/DJ

AUTHOR: Ristkheyn, E. M.; Tammemyagi, Kh. A.; Tiysmus, Kh. A.; Yanes, Kh. I.

ORG: Polytechnic Institute, Tallinn (Politekhnicheskiy institut)

TITLE: Testing of EMN-7 induction pump on liquid magnesium

SOURCE: Tallinn. Politekhnicheskiy institut. Trudy. Seriya A, no. 214, 1964. Issledovaniye i rpoyektirovaniye elektromagnitnykh sredstv peremeshcheniya zhidkikh metallov; sbornik trudov, no. 2, 111-122

TOPIC TAGS: electromagnetic pump, liquid metal pump, magnesium

ABSTRACT: Experiments were carried out at TPI to determine the performance of the EMN-7 pump in the case of liquid magnesium at 700-800°C. The following advantages of electromagnetic pumps were establihsed: the tract through which the metal flows can be hermetically sealed; the pressure can be controlled electrically over a wide range; the material used (St 3 steel) is stable in liquid magnesium; filling of the metal tract with argon excludes the burning off of magnesium during the transfer; the pump can melt magnesium which solidifies the channel. The pumping system can be completely automated. The experiments also show-

UDC: 621.318.38

Card 1/2

L 12041-66

ACC NR: AT5028830

ed that some of the heating elements can be disconnected under steady state conditions without impairing the process in any way. Orig. art. has: 10 figures.

SUB CODE: ~~EE~~ 13/ SUBM DATE: 00/ ORIG REF: 001/ OTH REF: 000

BC

Card 2/2

VERTE, Leonard Arturovich; VOL'DEK, A.I., doktor tekhn. nauk, prof. retsenzent; YANES, Kh.I., kand. tekhn. nauk, dots., retsenzent; ROZENTSVEYG, Ya.D., red.

[Electromagnetic conveying of liquid metal] Elektromagnitnyi transport zhidkogo metalla. Moskva, Metallurgiia, 1965. 235 p. (MIRA 18:3)

ACC NR: AT6032908 SOURCE CODE: UR/2807/65/000/231/0003/0012

AUTHOR: Kyul'm, E. G.; Yanes, Kh. I.

ORG: none

TITLE: Electromagnetic calculation of cylindrical pumps without a ferromagnetic core

SOURCE: Tallinn. Politekhnicheskiy institut. Trudy. Seriya A, no. 231, 1965. Issledovaniye i proyektirovaniye elektromagnitnykh sredstv peremeshcheniya zhidkikh metallov (Investigation and design of electromagnetic means for the transfer of liquid metals); sbornik trudov, no. 3, 3-12

TOPIC TAGS: liquid metal pump, magnetic induction, electromagnetic field

ABSTRACT: Electromagnetic processes in the nonmagnetic gap of a cylindrical pump without a ferromagnetic core are described by a system of differential equations of the electromagnetic field. Using a knowledge of the vector potential $\bar{A}$ and assuming that div $\bar{A} = 0$, instead of this system of differential equations, we get the following equation:

$$\Delta\bar{A} = -\mu\bar{\delta}. \quad (1)$$

In the nonconducting zone of the nonmagnetic gap, the vector of the current density, $\bar{\delta}$ is equal to zero, and

$$\Delta\bar{A} = 0. \quad (2).$$

 UDC: 621.318.38

ACC NR: AT6032908 O

In the solution of these equations, the following assumptions are made: a) the length of the magneto along the z axis (see Fig. 1) is infinitely great, that is, the longitudinal boundary effect is not considered; b) the inside surface of the magneto is smooth; c) the winding of the magneto is assumed to be infinitely thin; d) the magnetic permeability of the electrotechnical steel $\mu = \infty$, and the magnetic permeability of the dielectric and conducting media $\mu = \mu_0$; e) the wall material of the channel is nonconducting; f) the liquid metal in the channel moves at a constant velocity. On the above basis, subsequent sections of the article deal mathematically with the electromagnetic head, the total power of the nonmagnetic gap of a cylindrical pump, and the displacement of a cylindrical pump. Orig. art. has: 32 formulas and 4 figures.

L 08115-67

ACC NR: AT6032908

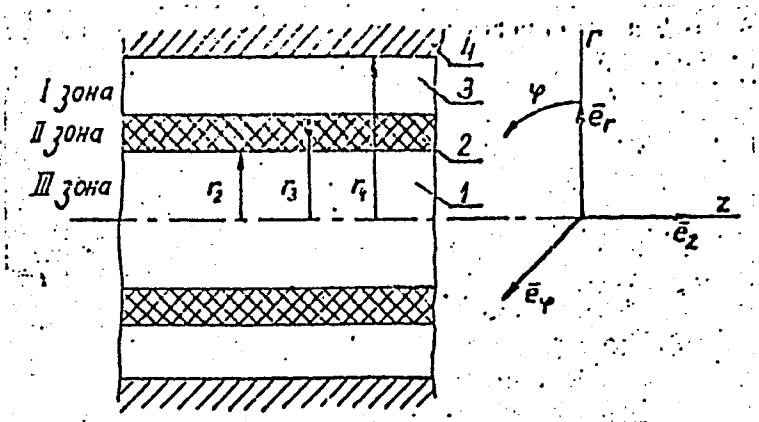

Fig. 1. Schematic section of a cylindrical pump without inner ferro-magnetic core. System of coordinate axes. 1—nonmagnetic gap; 2—liquid metal; 3—thermal insulation; 4—magneto.

SUB CODE: 20/ SUBM DATE: none/ ORIG REF: 006

Card 3/3 nst

L 08187-67 EWT(1) IJP(c)

ACC NR: AT6032910 SOURCE CODE: UR/2807/65/000/231/0057/0068

AUTHOR: Vallaste, E. V.; Yanes, Kh. I.

33
B+1

ORG: none

TITLE: The magnetic field of the three-phase winding of an induction channel

SOURCE: Tallinn. Politekhnicheskiy institut. Trudy. Seriya A, no. 231, 1965. Issledovaniye i proyektirovaniye elektromagnitnykh sredstv peremeshcheniya zhidkikh metallov (Investigation and design of electromagnetic means for the transfer of liquid metals); sbornik trudov, no. 3, 57-68

TOPIC TAGS: magnetic field, magnetic induction

ABSTRACT: The method of calculation is based on a previously published method for determining the field of a single-phase winding. Thus, the article starts with a mathematical development of the magnetic field of a single-phase winding. The results of the theoretical calculations are shown in a series of curves. The authors then pass on to the extension of the method to the three-phase case. The theoretical conclusions were checked by experiments on a three phase inductor with a two layer diametral winding. Experimental results, shown graphically, agree satisfactorily with theory. In addition, tests were carried out on the magnetic induction along the length of the magneto. It was found that, over three quarters of the length of the magneto the

Card 1/2 UDC: 621.318.38

L 08187-67

ACC NR: AT6032910 O

magnetic induction changes only slightly, and that it falls uniformly at both ends.
Orig. art. has: 8 formulas and 6 figures.

SUB CODE: 20/ SUBM DATE: none/ ORIG REF: 005

Card 2/2 dda

ACC NR: AP6034908 SOURCE CODE: UR/0382/66/000/002/0135/0138

AUTHOR: Vol'dek, A. I.; Rannu, L. Kh.; Yanes, Kh. I.

ORG: none

TITLE: On certain new orientations in the development of special windings for devices with a traveling magnetic field.

SOURCE: Magnitnaya gidrodinamika, no. 2, 1966, 135-138

TOPIC TAGS: magnetic induction, winding, magnetic field, MHD generator

ABSTRACT: Special windings are required for devices of this kind, such as liquid-metal induction pumps, MHD induction generators with a liquid-metal working fluid, steel-furnace melt stirrers, rotators of molten metal in tube-casting installations, etc. because this involves substantial linear current loads and often requires internal water-cooling of the windings. In this connection, the article describes the design and specifications of more suitable windings which are beginning to be introduced. They have the shape of flat concentric coils, which greatly simplifies their fabrication and installation and enhances their operating reliability. Under normal conditions their performance is inferior to that of conventional helical windings, but

Card 1/2 UDC: 621.313.39:538.4

ACC NR: AP6034908

once the nonmagnetic clearance between two ferromagnetic cores increases to a considerable extent, and thus necessitates a marked increase in the linear current load of the windings· (as is the case with the electromagnetic induction pump and other similar devices with a traveling or rotating magnetic field) these new flat concentric coil-shaped windings outperform their conventional counterparts and display such additional advantages as greater compactness of the inductor and more or less complete elimination of nonuniformity of coil spacing owing to the shortening of this spacing. Orig. art. has: 1 table.

SUB CODE: ~~20~~, 09, 13/ SUBM DATE: 17Dec65/ ORIG REF: 004

Card 2/2

Yanes, Kh. Ya.

YANES, Kh.Ya. [Jänes, H.J.] (Tallinn)

Material on health aspects of fuel shale dust. Gig.truda i prof. zab. 1 no.3:20-23 My-Je '57. (MIRA 11:1)

1. Institut eksperimental'noy i klinicheskoy meditsiny AN Estonskoy SSR.
(OIL SHALES) (DUST)

BELIOVSKAYA, T.S.; SAARE, A.K.; YANMS, Kh.Ya. [Jänes, H.J.]

Occurrence of helminths among individual groups of the population of the Estonian S.S.R. Med.paraz. i paraz.bol.supplement to no.1: 64-65 '57. (MIRA 11:1)

1. Iz Instituta eksperimental'noy i klinicheskoy meditsiny Akademii nauk Estonskoy SSR.
(ESTONIA--WORMS, INTESTINAL AND PARASITIC)

SHEVAL'YE, A.V.; SHAMARDIN, B.M.; SHAMARDINA, N.A.; YANES, Kh.Ya. [Jänes, H.] (Tallinn).
Influence of vibration from an electric drill on drillers in shale mines. Gig. truda i prof. zab. 4 no.5:24-26 My '60. (MIRA 13:9)

1. Institut eksperimental'noy i klinicheskoy meditsiny Akademii nauk Estonskoy SSR.
(VIBRATION--PHYSIOLOGICAL EFFECT)
(BORING--HYGIENIC ASPECTS)

AKKERBERG, I.I., kand.med.nauk; BLINOVA, E.A.; VIDOMENKO, A.N.; YURGENSON, I.A. [Jürgenson, I.], kand.biologicheskikh nauk; YANES, Kh.Ya. [Jänes, H.]

Hygienic determination of air pollution in a shale industry region. Gig.i san. 25 no.8:5-7 Ag '60. (MIRA 13:11)

1. Iz Instituta eksperimental'noy i klinicheskoy meditsiny Akademii nauk Estonskoy SSR.
(AIR--POLLUTION) (SULFUR DIOXIDE)

YANES, Kh.Ya., kand.med.nauk

"Schistous pneumoconiosis (pneumoconiosis caused by dust of kukerside oil shales)" by V.A.Kiung. Reviewed by Kh.IA.IAnes. Gig. i san. 26 no.5:123-124 My '61. (MIRA 15:4)
(LUNGS—DIST DISEASES) (KIUNG, V.A.)
(OIL-SHALE INDUSTRY—HYGIENIC ASPECTS)

VELDRE, Ingeborg Aruturovna[Veldre, Ingeborg]; YANES, Kh.[Janes, H.], red.; TOOMSALU, E., tekhn. red.

[Materials for the hygienic evaluation of waste waters of the shale industry]Materialy k gigienicheskoi otsenke stochnykh vod slantsevoi promyshlennosti. Tallinn, Akad. nauk Estonskoi SSR, 1962. 115 p. (MIRA 16:2)
(Estonia--Industrial wastes) (Phenols)

IANES, Kh. IA. [Jänes, H.]

"Carcinogenic action of the products from the reprocessing of Estonian oil-shale" by P. A. Bogovskii. Reviewed by Kh. IA. IAnes. Gig. truda i prof. zab. no.3:58-59 '62. (MIRA 15:4)

(ESTONIA--OIL-SHALES--TOXICOLOGY)
(CARCINOGENS) (BOGOVSKII, P. A.)

YANES, Kh.Ya. [Jänes H.] (Tallin)

Toxicity of Estonian shale tars. Gig.truda i prof.zab. 6 no.6: 33-38 Je '62. (MIRA 15:12)

1. Institut eksperimental'noy i klinicheskoy meditsiny Akademii nauk Estonskoy SSR.
(ESTONIA—TAR—TOXICOLOGY)

YANESHNIKOV, M. M.

1. YANESHNIKOV, M. M.

2. USSR (600)

4. Technology

7. Illumination of the enterprises of the machine-building industry, Moskva, Mashgiz, 1952.

9. Monthly List of Russian Accessions, Library of Congress, April, 1953, Uncl.

KHODALEVICH, A.N.; BREYVEL', I.A.; BREYVEL', M.G.; VAGANOVA, T.I. [deceased]; TORBAKOVA, A.F.; YANET, F.Ye., Prinimali uchastiye: SOKOLOV, B.S.; VAGANOVA, T.I. [deceased]; SHURYGINA, M.V.. PRONIN, A.A., red.; GOROKHOVA, T.A., red.izd-va; GUROVA, O.A., tekhn.red.

[Brachiopods and corals from the Eifelian bauxite-bearing deposits of the eastern slope of the Central and Northern Urals] Brakhiopody i korally iz eifel'skikh boksitonosnykh otlozhenii vostochnogo sklona Srednego i Severnogo Urala. Moskva, Gos.nauchno-tekhn. izd-vo lit-ry po geol. i okhrane nedr, 1959. 282 p. (MIRA 13:3)

1. Russia (1923- U.S.S.R.) Ministerstvo geologii i okhrany nedr. Ural'skoye geologicheskoye upravleniye.
(Ural Mountains--Brachiopoda, Fossil)
(Ural Mountains--Corals, Fossil)

YANET, F.Ye.

Stratigraphic significance of middle Devonian Tabulata on the eastern slope of the Urals. Dokl. AN SSSR 135 no.3:698-700 N '60.
(MIRA 13:12)

1. Ural'skoye geologicheskoye upravleniye Ministerstva geologii i okhrany nedr SSSR. Predstavleno akad. A.L. Yanshinym.
(Ural Mountains—Corals, Fossil)
(Paleontology, Stratigraphic)

YAKUTSOVA, N.M., Cand Med Sci--(diss) "Operation ~~of the~~ irido-sclerectomy in glaucoma (Clinico-experimental- histological study)." Smolensk, 1958. 16 pp (Minsk State Med Inst), 200 copies (KL,44-58, 126)

YANEV, As.
~~SURNAME (in caps)~~; Given Names

Country: Bulgaria

Academic Degrees: not indicated

Affiliation: not indicated

Source: Sofia, Biologiya i Khimiya, No 2, 1961, pp 8-15

Data: "The Significance of Plant Coloration."

YANEV, B.

AID P - 2633

Subject : USSR/Medicine

Card 1/1 Pub. 37 - 10/22

Author : Yanev, B., Senior Scientific Worker

Title : Health protection of schoolchildren in the People's Republic of Bulgaria

Periodical : Gig. i san., 8, 40-45, Ag 1955

Abstract : Describes in detail the work of various medical services for children in Bulgaria. They were established after the reorganization of the Ministry of Health in 1950. In 1952 the Institute of Physical Training and School Hygiene, attached to the Bulgarian Academy of Sciences, was founded. According to the author, Bulgarian school physicians' are highly qualified.

Institution : Institute of School Hygiene and Physical Training, Bulgarian Academy of Sciences

Submitted : Ap 19, 1955

OKSMAN, Ya.B.; BABAYEV, A.; BOGUSH, G.; DOLINA, Ye.; KOVYNEV, B.; MIRNYY, G.; RUBEO, Stelio(Italiya); SING, Ramkhandr (Indiya); SOMOV, Yu.; KHARSH, D'yerd'(Vengriya); YUR'YEV, M.; YANEV, Kirill (Bolgariya); LAPIDUS, M.A., red.; BALLOD, A.I., tekhn.red.

[Foreign visitors on Soviet agriculture; impressions of participants in the Sixth World Festival of Youth and Students] Zarubezhnye gosti o sel'skom khoziaistve SSSR; vpechatleniia uchastnikov VI Vsemirnogo festivalia molodezhi i studentov. Moskva, Gos.izd-vo sel'khoz.lit-ry, 1958. 239 p. (MIRA 12:4)
(Agriculture)

4059. ON SOME CLINICAL SYNDROMES CAUSED BY TICK BITES (Bulgarian text) - Yancv P. Med. Dept., County Hosp., Panagyurishte - SĂVR. MED. 1958, 9/9 (42-45)

After an incubation period of a few hours to a few days, the disease starts suddenly with chills, high temperature, headache, muscle pains and general weakness. An exanthema on the body may appear. A primary affect, with a collateral infiltrate or regional lymphadenitis, may be recorded in some cases. No changes are found in the haemogram or in the urine. An infectious or allergic aetiopathogenesis of the disease is supposed.

(L, 6)

YANEV, P.; BOBOSHEVSKI, L.

Universal method for titrimetric determination of turbidity. Lab. delo 7 no.6:24-26 Je '61. (MIRA 14:7)

1. Gorodskaya bol'nitsa, Pangyurishche, Bolgaria.
(TURBIDITY)

YANEV, P.D. (Plovdiv, Bolgariya)

Disorders of the antitoxic function of the liver in silicosis. Klin. med. 41 no.7:33-36 Jl'63 (MIRA 16:12)

1. Nauchnyy rukovoditel' - zav. kafedroy bol'nichnoy terapii pri Vysshem meditsinskom institute prof. P.Mironov, Plovdiv, Bolgariya.

YANEV, P.D. [Ianev, P.D.], assistant

Chronic silicotic hepatitis. Folia med. (Plovdiv) 6 no.5: 334-340 '64

1. Institut de Hautes Etudes medicales "I.P.Pavlov" de Plovdiv, Bulgarie, Chaire des Maladies Internes et de Therapie (Directeur: prof. P. Mironov).

YANEV, P.D.

Role of liver lesions in the pathogenesis of silicosis. Pat. fiziol. i eksp. terap. 9 no.2:60-61 Mr-Ap '65. (MIRA 18:5)

1. Otdeleniye po vnutrennim boleznyam (zav. P.D.Yanev) Gorodskoy bol'nitsy Panagyurishcho, Bolgariya.

ACC NR: AP7003213 SOURCE CODE: UR/0056/66/051/006/1712/1721

AUTHOR: Komarov, I. V.; Yanev, R. K. (Research associate)

ORG: [Komarov] - Leningrad State University (Leningradskiy gosudarstvenny universitet); [Yanev] - Institute of Nuclear Sciences "Boris Kidric," Belgrade, Yugoslavia (Institut yadernykh nauk "Boris Kidrich")

TITLE: Molecular-term splitting in two-electron exchange

SOURCE: Zh eksper i teor fiz, v. 51, no. 6, 1966, 1712-1721

TOPIC TAGS: term splitting, charge exchange, asymptotic solution, variational method

ABSTRACT: The purpose of the investigation was to obtain an asymptotic experession for the term splitting produced when two atoms exchange a pair of electrons. It is pointed out that an earlier calculation by a variational method (I. K. Fetisov and O. B. Firsov, ZhETF v. 37, 95, 1959) was in error because of a poorly chosen trial function. It is shown that to obtain correct results it is necessary to choose for the zeroth approximation either the wave function of the isolated atom, or at least a function that approaches it asymptotically. When this is done, an asymptotically exact formula can be obtained for the splitting at large internuclear distances. The influence of th spin of the electrons that do not participate in the exchange is taken into account. The cross sections for double charge exchange in inert gases are calculated and are compared with earlier calculations and with the experimental data. While a rough agreement is observed, it is pointed out that the available ex-

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perimental data pertain to velocities lying near the limit of applicability of the presented theory. Experiments at lower velocities are therefore needed for a more reliable comparison. The authors thank Yu. N. Demkov for interest and valuable discussions. Orig. art. has: 2 figures and 38 formulas.

SUB CODE: 20/ SUBM DATE: 18Apr66/ ORIG REF: 009/ OTH REF: 006

Card 2/2

YANEV, V.

Resonance Amplifiers. Ministry and Communication, #12:36:Dec. 54.

Yanev, V.

Band Amplifiers. In Radio Engineering, No. 1:20 Jan 55

YANEV, V.

Mixers. In Radio Engineering, No. 2:23 Feb 55

YANEV, V.

Low Frequency Amplifiers. Radio Engineering, #4;28:Apr.55

YANEV, V.

Diode and Grid Detectors. "RADIO" Ministry of Communication, #9:20: Sept 55

YANEV, V.

The Polish "Sirena" Receiver (Diagram). "RADIO" Ministry of Communication, #9:22: Sept 55

YANEV, V.

Broad Band Amplifiers. "RADIO" Ministry of Communication, #12:33:Dec. 55

YANEV, V.

Three-tube Receiver with a Tuning Indicator. "RADIO" Ministry of Communications, #12:37:Dec. 55

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ACCESSION NR: AT3002411

55

AUTHOR: Dragnev, T.; Kashukeev, N.; Pancheva, N.; Yaneva, N.

TITLE: Moment of emission of prompt neutrons in the fission of heavy nuclei 19

SOURCE: B"lgarska akademiya na naukite, Fizicheski institut. Izvestiya na Fizicheskiya institut s ANEB, v. 10, no. 2, 1962, 53-56

TOPIC TAGS: prompt neutron, fission, heavy nucleus, fragment, fragment motion, fragment velocity

ABSTRACT: A new method is propsed for determining the moment of emission of prompt neutrons during the fission of heavy nuclei. Thereby an answer can be obtained to the question whether neutrons are emitted after fragments have attained ultimate velocity or sooner. The method for finding the velocity of the fragments at the moment of the emission of neutrons consists in a comparison between theoretically calculated and experimentally obtained energy distributions of neutrons at different angles to the direction of fission registered at a fixed ultimate velocity of the fragments. The time of emission of neutrons is determined in

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